

CLAIMS

1. In a method of producing an multi-element superconducting wire, where the superconductor precursor consists of mono-element filaments which react with at least one other element during the production process to form multi-element filaments, which filaments expand during the production process and which filaments are prone to filament bridging during use, the improvement comprising incorporating in the superconducting wire least one bridging barrier extending radially from the center to the outer edge of the wire.
2. The method of claim 1 where the multi-element filament is Nb_3Sn .
3. The method of claim 1 where the radially extending barrier material is selected from the group consisting of Ta, Va, NbTa alloys, combinations thereof and sandwiches of Nb surrounding such other materials.
4. The method of claim 1 where the effective filament diameter is in the range of from about 5 to about 100 $\mu\text{microns}$.
5. The method of claim 1 where the effective filament diameter is in the range of from about 5 to about 40 $\mu\text{microns}$.
6. The method of claim 1 further comprising incorporating an Nb circumferential barrier.
7. The method of claim 1 comprising from 2 to about 12 barriers.
8. The method of claim 1 comprising from 2 to about 6 barriers.
9. A multifilament composite material comprising a copper core, a multitude of niobium-tin filaments, an outer diffusion barrier, at least one radial reaction barrier.
10. The composite material of claim 9 also comprising an outer copper stabilizer layer.
11. The product of the process of claim 1 where the volume fraction of the Nb_3Sn is at least about 50 volume percent.